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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,586	02/23/2004	Harry A. Atwater JR.	047071-0109	9646
22428	7590	08/23/2006	EXAMINER	
FOLEY AND LARDNER LLP			AHMED, SHAMIM	
SUITE 500			ART UNIT	
3000 K STREET NW			PAPER NUMBER	
WASHINGTON, DC 20007			1765	

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/784,586

Applicant(s)

ATWATER ET AL.

Examiner

Shamim Ahmed

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 40-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 40-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/24/06; 11/15/05; 1/7/05;</u> | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's election without traverse of Group II (claims 40-51) in the reply filed on 7/24/06 is acknowledged.

#### ***Specification***

2. The disclosure is objected to because of the following informalities: At the beginning of the specification, the continuing data needs to be updated because the application Serial No. 10/125,133 filed on 04/17/2002 is now US patent 7,019,339.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1765

5. Claims 40-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kub et al (6,323,108) in view of Beasom et al (5,801,084).

Kub describes a method for forming ultra-thin bonded semiconductor layers comprising:

- preparing or treating the surface of a substrate (10) having ultra-thin semiconductor layers (claimed device substrate) and a second substrate 18 (claimed handle substrate) (col. 5, line 14-36,col. 6, line 1-15) bonding the two substrates to form a bonded interface (col. 6, line 23-25);
- removing a portion of the substrate 10 (device substrate) that resemble with the claimed thinning step so as to leave ultra-thin semiconductor layer (16) on the handle substrate 18 and thus forming a structure as shown in figure 1E, which resemble with claimed virtual substrate (col. 6, line 38-46).

Kub et al remain silent regarding the step of forming a material on a back surface of the handle substrate that possesses the claimed coefficient of thermal expansion (CTE) value.

However, in a method of improved wafer bonding process, Beasom et al teach that back surface of handle wafer is protected by forming a material layer as stress compensation layer for protecting the handle wafer from bending during the bonding process (col.8, lines 20-28 and claim 1).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Beasom et al's teaching into Kub et al's process for protecting the handle wafer from bending as taught by Beasom et al.

Art Unit: 1765

As regards to claim 41, the method includes hydrogen ion implanting into the substrate 10 prior to bonding, which would enable exfoliation of the ultra-thin semiconductor layers (or device film) from the substrate 10 annealing the device after the bonding step (col. 5, line 56-67, col. 6, line 39-45).

### ***Double Patenting***

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 40-51 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 36-51 of U.S. Patent No. 7,019,339 in view of Beasom et al (5,801,084). Both of the invention describes forming a virtual substrate by bonding the substrates and annealing the bonded substrates to exfoliate the device from the device substrates except for the formation of a material layer on the back surface of the handle wafer.

However, in a method of improved wafer bonding process, Beasom et al teach that back surface of handle wafer is protected by forming a material layer as stress compensation layer for protecting the handle wafer from bending during the bonding process (col.8, lines 20-28 and claim 1).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Beasom et al's teaching into the teaching of patent '339 for protecting the handle wafer from bending as taught by Beasom et al.

8. Claims 40-51 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 111,130,134-135,145,146 of copending Application No. 10/761,918. Although the conflicting claims are not identical, they are not patentably distinct from each other because the invention of the copending application broadly encompasses the instant invention such as the claimed CTE value would have been within the claimed invention in the copending application as they used similar material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Claims 40-41 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 29 of copending Application No. 11/004,948 (US 2005/0085049 A1) in view of Beasom et al (5,801,084).

Art Unit: 1765

Both of the invention describes forming a virtual substrate by bonding the substrates and annealing the bonded substrates to exfoliate the device from the device substrates except for the formation of a material layer on the back surface of the handle wafer.

However, in a method of improved wafer bonding process, Beasom et al teach that back surface of handle wafer is protected by forming a material layer as stress compensation layer for protecting the handle wafer from bending during the bonding process (col.8, lines 20-28 and claim 1).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Beasom et al's teaching into the teaching of copending application for protecting the handle wafer from bending as taught by Beasom et al.

This is a provisional obviousness-type double patenting rejection.

10. Claims 40,45 and 50 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 29 of copending Application No. 11/004,808 (US 2005/0142879 A1) in view of Beasom et al (5,801,084).

Both of the invention describes forming a virtual substrate by bonding the substrates and annealing the bonded substrates to exfoliate the device from the device substrates except for the formation of a material layer on the back surface of the handle wafer with the claimed CTE value.

However, in a method of improved wafer bonding process, Beasom et al teach that back surface of handle wafer is protected by forming a material layer as stress

Art Unit: 1765

compensation layer for protecting the handle wafer from bending during the bonding process (col.8, lines 20-28 and claim 1).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Beasom et al's teaching into the teaching of copending application for protecting the handle wafer from bending as taught by Beasom et al.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Linn et al (5,849,627) illustrates the formation of stress compensation layer on both sides of the handle and device wafer for protection.

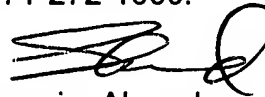
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
August 21, 2006